having a BET surface area of 10-100 m^2/g as a filler to achieve a desired porosity of the paper.--

REMARKS

1. Claim Objections

As noted above, reference to claim numbers in this Amendment and in future papers will be with respect to the renumbered sequence of claims.

Claims 31, 33 and 36 have been amended to remove the informalities noted by the Examiner.

2. Rejection of Claims Under 35 U.S.C. 112, Second Paragraph

Claim 25 has been amended to delete the phrase beginning with "in particular", and the subject matter of that phrase is now recited in new claim 46.

The Examiner has also rejected claims 34 and 42 alleging that these claims are vague and indefinite. Applicants submit that the terms utilized in those claims are well understood by those skilled in the art, such that, the claims are not vague or indefinite. For example, the terms "silicates, oxides, hydroxides, and sulfate" are chemical terms that are well known to those skilled in the art. The terms are admittedly rather broad, encompassing a significant number of useful fillers, but this breadth does not make the claim objectionable when the terms utilized therein would be well understood by those skilled in the art. Accordingly, reconsideration and withdrawal of the rejections are requested.

3. Rejection of Claims Under 35 U.S.C. 102

Claims 24 and 28-36 have been rejected as being anticipated by Gill et al. (U.S. Patent 4,892,590) and Nishiguchi et al. (U.S. Patent 5,879,442). These rejections are respectfully traversed. Reconsideration and withdrawal thereof are requested.

The present invention is particularly directed to an uncoated "wood-containing" paper and a process for regulating the printing properties of such paper. The term "wood-containing" paper is understood in the art to refer to paper which contains fibers that comprise a substantial lignin

component. A discussion of these terms as utilized in the paper manufacturing art is set forth on page 6, lines 16-30 of the Specification.

While the present invention is directed to "wood-containing" paper, the Gill et al reference makes no mention of wood-containing paper and actually only discloses paper produced from pulp treatment by the paper "Kraft Process" which removes the lignin component and results in wood-free paper.

Nishiguchi et al. similarly is silent with respect to wood-containing paper. In addition, Nishiguchi et al. discloses the use of PCC as a base pigment in the preparation of a paper coating composition. The present invention, on the other hand, is directed to uncoated wood-containing paper.

For the above reasons, it is submitted that neither Gill et al. nor Nishiguchi et al. discloses all of the elements of the present claims, such that neither of the references can properly be found to anticipate the present invention under 35 U.S.C. 102. Accordingly, reconsideration and withdrawal of the rejection are requested.

4. Rejections Under 35 U.S.C. 103

Claims 25-27 and 37-42 have been rejected under 35 U.S.C. 103 over Gill et al. or Nishiguchi et al. This rejection is respectfully traversed.

As noted above, the present invention is directed to uncoated wood-containing paper, and a process for regulating the porosity of such paper. It is very important in paper manufacturing to be able to control both the degree and uniformity of the porosity of the paper. But despite the fact that various methods were known in the art for controlling the porosity of paper, none of the methods available prior to the present invention was ideal, and there was still a need for improvement when dealing with wood-containing paper. The problem of being able to sufficiently regulate paper porosity is especially relevant for wood-containing paper, and in particular uncoated wood-containing paper in which porosity control is more difficult than in conventional disclosed coated paper.

4.1 The prior art would not motivate one skilled in the art to use PCC as a filler in wood-containing paper, and would actually teach against such use.

Although some limited uses for colloidal PCC in paper manufacturing have been disclosed, there has been no suggestion to use such colloidal PCC as a filler in wood-containing paper or for controlling the porosity of such paper. In fact, there has been a prejudice in the art against using colloidal PCC as a filler in paper due to the negative effects of colloidal PCC in fine paper (wood-free paper), where even small amounts of colloidal PCC can have dramatic effects in terms of reduced sizing and/or an increased need for sizing agents such as alkylketene dimers (AKD) and alkenylsuccinic acid anhydride (ASA).

This is for example illustrated in the enclosed article from Tappi Journal (Bartz et al., "Alkyl ketene dimer sizing efficiency and reversion in calcium carbonate filled papers", Tappi Journal, Vol. 77, No. 12, pp. 139-148, 1994). The article describes the influence of various factors, including PCC particle size, on sizing efficiency in alkaline paper as well as the phenomenon known as size reversion, i.e. loss of water repellency over time. It is concluded (see e.g. page 145, bottom of middle column and top of right-hand column) that sizing efficiency improves with larger PCC particle sizes due to the fact that the smaller pore surface areas in such larger particles render more of the alkyl ketene dimer sizing agent available. In contrast, small particle sizes - i.e. a larger surface area - reduce sizing efficiency. Since it is desirable for various reasons to achieve sufficient sizing using as little sizing as necessary (see e.g. page 139, right-hand column), the decreased sizing efficiency resulting from small PCC particles would have tended to discourage the person skilled in the art from using PCC with a large surface area, such as the colloidal PCC used according to the present invention, as a filler.

Additionally, colloidal PCC has also been known to negatively influence the mechanical properties (strength) and optical properties (whiteness and opacity) of paper compared to other types of PCC. Furthermore, PCC with a small particle size and a high surface area is known to reduce the sheet stiffness of paper. Since control of porosity is of less significance in wood-free paper than in woodcontaining paper, the known negative effects of colloidal PCC in wood-free paper have played a

greater role than possible benefits for porosity control. Thus, there has been no motivation in the art to use colloidal PCC for the purpose of porosity control. In fact, there has on the contrary been a prejudice in the art that has worked against such use, and the common conception in the art has been that colloidal PCC is unsuitable for use as a filler in paper.

4.2 Gill et al. teaches the use of PCCT for a completely different purpose.

Gill et al. discloses the use of a two-component binder system as a retention agent for paper manufacture, wherein the binder comprises colloidal PCC with a high specific surface area together with a cationic starch. The PCC used has a surface area of 10-200 m^2/g, and the weight ratio between PCC and cationic starch is from 2:1 to 1:20. No influence on porosity is disclosed or suggested. Furthermore, since the PCC in this case is used not as a filler, but rather as a retention agent in combination with cationic starch, the amount of PCC used is so small that it cannot have any significant influence on the porosity of the paper. See e.g. the examples in Table 1 of Gill et al., where the PCC is used in an amount of 0.1-0.25% by weight. This is clearly an entirely different use of colloidal PCC than that of the present invention.

Regarding the nature of the paper produced by Gill *et al.*, it should be noted that only wood-free paper is disclosed, i.e. paper produced from pulp treated by the Kraft process in order to remove the lignin component. It is well-known in the art that use of the Kraft pulp treatment results in better quality fibres, but with the disadvantages that the fibres are more expensive and that the yield is reduced to about half. In addition, the Kraft process is costly in terms of energy and chemicals. Thus, for both economic and environmental reasons, techniques that eliminate or reduce the need for Kraft pulp fibres are desirable.

4.3 Nishiguchi et al. does not suggest an uncoated wood-containing paper.

Nishiguchi et al. discloses the use of PCC as a base pigment in the preparation of a paper coating composition. Nishiguchi *et al.* discloses a method for the preparation of an aqueous slurry of calcium carbonate. The PCC used has a surface area of 525 m^2/g, the ratio between precipitated and ground PCC is in the range of 20:80 to 80-20 and the content of PCC in the aqueous

slurry is in the range of 70-85% by weight. Furthermore, PCC is used by Nishiguchi et al. for the preparation of a coating composition for the production of coated paper products whereas the present invention deals with <u>uncoated</u> wood-containing paper. Thus, it is clearly an entirely different use of colloidal PCC than that of the present invention.

Since neither Gill et al. nor Nishiguchi et al. suggest important elements of the claimed invention, no combination of the two references can be found to teach or suggest the present invention. Neither reference recognizes or solves the problem of the prior art which was solved by the present invention, and neither reference would motivate one skilled in the art to regulate the porosity and printing properties of uncoated wood-containing paper by use of colloidal PCC as in the present invention. Accordingly, Applicants submit that neither of the references, alone or in combination, can properly be considered to render the present claims obvious within the meaning of 35 U.S.C. 103.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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BIRCH, STEWART, KOLASCH & BIRCH, LLP

____
(Signature)

November 4, 2002
(Date of Signature)

LRS/lmt
0459-0495P

Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

The claims have been amended as follows:

24. (Amended) A process for regulating the porosity and printing properties of uncoated wood-containing paper, the process comprising using a sufficient quantity of colloidal precipitated calcium carbonate (PCC) having a BET surface area of 10-100 m^2/g as a filler to achieve a desired porosity of the paper.

25. (Amended) A process according to claim 24 wherein the paper is SC paper, [in particular SC-A paper,] and wherein colloidal PCC is used in a quantity sufficient to achieve a porosity of at most 0.30 µm/Pas.

31. (Amended) A process according to claim 30 wherein colloidal PCC is incorporated into the paper in an amount of at least about 2% by weight based on the total weight of the paper.

32. (Amended) Uncoated wood-containing paper containing colloidal precipitated calcium carbonate (PCC).

33. (Amended) Paper according to claim 32 containing colloidal PCC having a BET surface area of 10-100 m^2/g as a filler.

36. (Amended) Paper according to claim 32 wherein the colloidal PCC is present in an amount of at least about 1 % by weight based on the total weight of the paper.

43. (Amended) A pigment mixture suitable for paper manufacture and comprising colloidal precipitated calcium carbonate (PCC) having a BET surface area of 10-100 m^2/g in combination with at least one filler selected from the group consisting of: kaolin, calcined kaolin, gypsum,

chalk, ground marble, silicate-containing minerals, sulphate-containing minerals, oxide-containing minerals, carbonate-containing minerals, hydroxide-containing minerals, calcium sulfoaluminates, plastic particles and organic pigments.

Claims 46-47 have been added.

46. (New) The process according to claim 25, wherein the paper is SC-A paper.

47. (New) A process for regulating the porosity and printing properties of uncoated wood-containing paper wherein at least about 5% by weight of the publis is lignin-containing pulp, the process comprising using a sufficient quantity of colloidal precipitated calcium carbonate (PCC) having a BET surface area of 10-100 m^2/g as a filler to achieve a desired porosity of the paper.